

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
26 May 2005 (26.05.2005)

PCT

(10) International Publication Number  
**WO 2005/047981 A2**

(51) International Patent Classification<sup>7</sup>: **G03F 7/20**

(21) International Application Number:  
PCT/US2004/037542

(22) International Filing Date:  
10 November 2004 (10.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/518,862 10 November 2003 (10.11.2003) US  
60/531,129 18 December 2003 (18.12.2003) US

(71) Applicant (for all designated States except US): **NIKON CORPORATION [JP/JP]**; 2-3 Marunouchi, 3-chome, Chiyoda-ku, Tokyo, Tokyo 100-8331 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ALTON, Phillips, H. [US/US]**; 480 E. Okeefe Street, #304, East Palo Alto, CA 94303 (US). **SOGARD, Michael, R. [US/US]**; 516 Placitas Avenue, Menlo Park, CA 94025 (US). **WATSON,**

**Douglas, C. [US/US]**; 1353 Cameo Drive, Campbell, CA 95008 (US). **TANAKA, Keiichi [JP/JP]**; 7-7-40-1416, Kamiochiai, Chuo-ku, Saitama-ken, Saitama-shi, Saitama 338-0001 (JP).

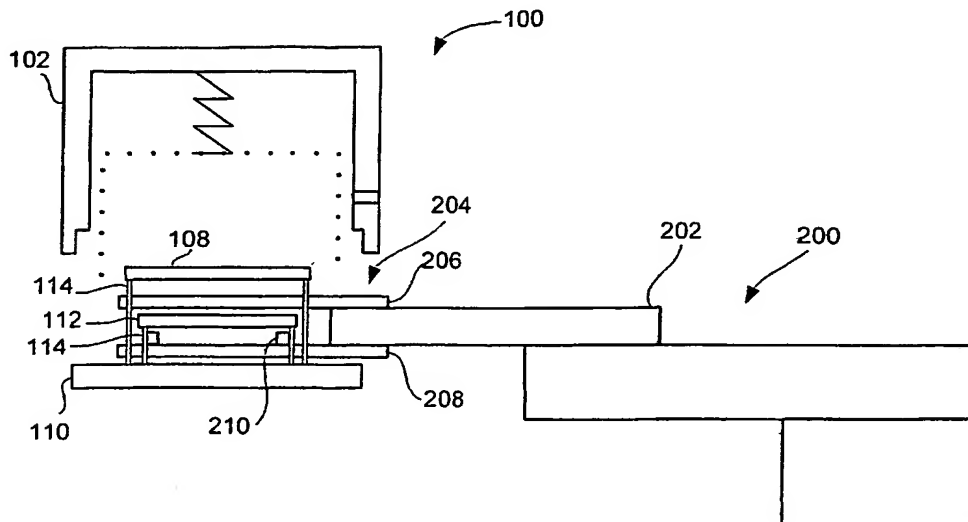
(74) Agent: **LEE, Phillip, P.**; Beyer Weaver & Thomas, LLP, P.O. Box 70250, Oakland, CA 94612-0250 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE,

[Continued on next page]

(54) Title: **THERMOPHORETIC TECHNIQUES FOR PROTECTING RETICLES FROM CONTAMINANTS**



(57) Abstract: Thermophoresis within lithography systems for protecting reticles from contaminants (e.g., floating particles). Generally, thermophoretic protection is implemented by maintaining the reticle at a higher temperature than its surrounding environment. Thermophoretic protection can be maintained throughout a reticle's use in a lithography system. For example, a reticle can be thermophoretically protected while in storage, through various stages of transportation via a reticle handler (also referred to as an end-effector), to its period of use while attached to a reticle chuck.

BEST AVAILABLE COPY

WO 2005/047981 A2



SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**Published:**

- without international search report and to be republished upon receipt of that report

BEST AVAILABLE COPY